interest in the visitors to the Insect House. Just at present these moths are about commencing their individual life-cycles afresh; eggs of several species have been procured, and will shortly be hatched. The caterpillars are even more interesting than the moths themselves, and their remarkable shapes and forms, and their wonderful spines and thorns, are of much interest to naturalists. Just now, too, there may be seen in the Insect House a delightful example of the early stages of insect-life in the form of the caterpillar and chrysalis of *Limenitis disippus*. This is a North American butterfly, the egg of which is hatched towards the end of summer or in autumn. Its young larva constructs for itself a delicate habitation by joining together the edges of the leaves of the willow on which it feeds, so as to form a cylindrical tube, which it lines with silk and closes at one end. The fragile creature is thus able to outlive the storms of wintry wind and weather, and to evade the ravagers of the animal world in search of food. In the protection of this dwelling it can be transmitted from North America to this country without injury to its vitality. As seen in the Insect House, the caterpillar is a curiously mottled, pale-brown, greenish and grey creature, with head bent down, but bearing on the prominent part just behind it two rather long, erect, slender horns of a deep black colour, each of them numerously spined. The chrysalis is even more remarkable, and hanging down from a twig displays itself in a very prominent manner. On the middle of its body there is an abrupt, elongate, black hump, about as conspicuous a deformity as could be devised, while at the base of this, on each side, there is a band of delicate and beautiful metallic colour. This band is in some way dependent for its tint on the living creature within, for no trace of it can be seen in the pupa-shell after the insect has escaped. This species of butterfly belongs to the family *Nymphalidæ*. The extraordinary spines of the caterpillars of this group have recently been studied, and many of them delineated, in an elaborate and interesting memoir by W. Müller, which will be found in the first volume of the *Zoologische Jahrbücher*.

The Diurnal Lepidoptera are not so well represented in the Insect House as they usually are at this time of year, there having been a great scarcity of pupæ last summer. But, besides the *Limenitis* above referred to, examples of one of the Swallow-tails (*Papilio machaon*), and of one of the large North American Skippers (*Gonioloba tityrus*), are now daily emerging from their pupa stage, and fresh additions are shortly expected.

NOTES.

WE are glad to learn, from the list of birthday honours, that the Companionship of the Bath has been conferred on Dr. James Bell, F.R.S., and the Companionship of St. Michael and St. George on Mr. Ellery. A baronetcy has been granted to Prof. Stokes; but, seeing that Prof. Stokes has been for many years President of the Royal Society, and that the Government never thought of offering him any special honour until he entered the House of Commons, we may conclude that he receives his baronetcy not as an illustrious investigator, but as a politician.

ON Saturday, Sir Frederick Bramwell, as President of the British Association, entertained the President-Elect, Prof. W. H. Flower, C.B., F.R.S., a large number of members of the Association, representatives of science, and other guests being invited to meet him. The dinner was given in the hall of the Goldsmiths' Company, the use of which was granted to him for the purpose by the Wardens of the Company. The list of guests included Lord Bramwell, F.R.S., Mr. Justice Denman and Mr. Justice Manisty, Mr. C. Lucas, Prime Warden of the Goldsmiths' Company, the Mayors of Newcastle and Gateshead, Sir F. A. Abel, C.B., F.R.S., Captain Abney, R.E., C.B., F.R.S., Prof. Roberts-Austen, F.R.S., Prof. Ayrton, F.R.S., the Ven. the Archdeacon of Bath, Sir I. Lowthian Bell, F.R.S., the Rev. Prof. Bonney, F.R.S., Sir J. Crichton Browne, F.R.S., Mr. Brudenell Carter, Mr. C. Cochrane (President of the Institution of Mechanical Engineers), Sir John Coode, K.C.M.G., Mr. W. Crookes, F.R.S., Prof. Boyd Dawkins, F.R.S., Prof. Dewar, F.R.S., Sir James Douglass, F.R.S., Mr. W. T. Thiselton-Dyer, C.M.G., F.R.S., Dr. John Evans, F.R.S., Mr. Francis Galton, F.R.S., Dr. Gamgee, F.R.S., Dr. Geikie, F.R.S., Mr. R. Giffen, Mr. Alfred Giles, M.P., Dr. Gladstone, F.R.S., Mr. G. B. Gregory, Mr. Thomas Hawksley, F.R.S., Prof. Henrici, F.R.S., Mr. Victor Horsley, F.R.S., Major-General Hutchinson, R.E., Prof. Judd, F.R.S., Colonel Laurie, C.B., M.P., Prof. Liveing, F.R.S., Mr. J. Norman Lockyer, F.R.S., Prof. McLeod, F.R.S., Major Marindin, R.E., Mr. Ludwig Mond (President of the Society of Chemical Industry), Mr. J. Fletcher Moulton, Q.C., F.R.S., Admiral Nicholson, C.B., Admiral Sir E. Ommanney, C.B., F.R.S., Sir P. Cunliffe-Owen, K.C.B., K.C.M.G., Dr. William Pole, F.R.S., Mr. W. H. Preece, F.R.S., Colonel Rich, R.E., Prof. Romanes, F.R.S., Sir H. E. Roscoe, M.P., F.R.S., Prof. Rücker, F.R.S., Dr. Russell, F.R.S. (President of the Chemical Society), Prof. J. S. Burdon Sanderson, F.R.S., Prof. Schäfer, F.R.S., Dr. P. L. Sclater, F.R.S., Sir William Thomson, F.R.S., Sir William Turner, F.R.S., Major Tulloch, R.E., Sir C. W. Wilson, R.E., K.C.B., K.C.M.G., Sir Francis de Winton, K.C.M.G., Mr. E. R. Wodehouse, M.P., and many others. In England, which in this respect differs widely from the other leading countries of Europe, men of science, including even those in State employ, are not invited to take part in such State functions as the birthday dinner. It was a happy thought on Sir Frederick Bramwell's part, therefore, to select the Queen's birthday as the day on which his dinner was to be given. Many of the most eminent men of science in the country had thus an opportunity of associating themselves with the expression of the general feeling of the community on an interesting public occasion. By this time it should surely be manifest to everyone that, on all such occasions, science should be prominently represented. The State has nothing to lose, but, on the contrary, has much to gain, by the full recognition of science as one of the most vital elements of national progress.

THE gold medal of the Linnean Society has been awarded this year to Prof. de Candolle, the eminent botanist, in recognition of his distinguished services to botanical science.

IN his Presidential address, delivered at the anniversary meeting of the Linnean Society on the 24th inst., Mr. Carruthers gave an interesting and detailed account of the existing portraits of Linnæus, many of which are in the Society's possession. The result of his inquiries showed that there are seven original and authentic portraits of Linnæus in existence; that the engravings most widely known are from the originals by Inlander and Roslin; and that these give the most faithful representation of the features of the great naturalist.

A NEW departure, likely to be productive of far-reaching results, has recently been taken in connection with the scientific work of the Scotch Fishery Board. Since 1809 the Scotch fisheries have been under special supervision, and at one time the Scotch fishery statistics were in advance of those of any other country. Previous to 1882 occasional scientific inquiries were made by Sir Lyon Playfair and Prof. Allman, and since 1882 investigations have been systematically carried on under the direction of Prof. Ewart and Sir James Maitland. Year by year the scientific work has been extended, and for some time a scientific department has existed in everything but in name.

This department, which seems to enjoy the confidence of the Scotch Office, and all the assistance the importance of the fisheries demands, has now been fully recognized and strengthened by the formation of a Committee of advice and reference, which includes representatives from all the Scotch Universities, and, in addition, an eminent statistician and the distinguished Director of the Edinburgh Science and Art Museum. The Committee, which is expected to advise as to technical and statistical as well as biological and physical questions, consists of Profs. Bayley Balfour, Crum Brown, Dittmar, D'Arcy Thompson, McIntosh, McKendrick, McWilliam, Traill, and Young; Sir R. Murdoch Smith, and Mr. G. A. Jameson. Those responsible for the formation of this Committee are to be congratulated, not only for the bold and enlightened policy displayed, but also for enlisting the active interest of so many distinguished men in the Scottish fisheries. The willingness of the members of this Committee to co-operate with the present directors of the scientific work is the best guarantee that their past labours have been appreciated, the best reward for surmounting the many difficulties that have necessarily been met with in initiating and carrying on fishery investigations.

MR. RICHARD BULLEN NEWTON, of the Geological Department, British Museum, has been promoted to an Assistantship of the first class.

MR. MELLUISH succeeds the late Mr. Johnston as Electrician to the Government of India.

MR. HALY, Curator of the Colombo Museum, has published a "first report" on the collection of moths in the Museum. It is compiled from Messrs. Coles and Swinhoe's catalogue of the moths of India and Ceylon, and Mr. Haly has added all that is at present known concerning their local distribution and the times of the year at which the species appear.

THE Johns Hopkins Hospital, Baltimore, was opened on May 7. An address was delivered on the occasion by Dr. Daniel C. Gilman, who spoke eloquently of the close relationship between the advancement of knowledge and the progress of charity.

MESSRS. TRÜBNER have issued the first number of what ought to be a useful monthly periodical—*The Periodical Press Index.* The aim of the editor is to present a record of the more important subjects dealt with in periodical literature at home and abroad. As it would become irksome in course of time to consult a monthly index, arrangements are being made for the publication of an additional yearly volume on a plan which will render it unnecessary for students to refer to each part month by month.

PROF. H. G. SEELEY, F.R.S., will conduct the London Geological Field Class to sections on the North Downs, showing Gault and Lower Greensand, on Saturdays in June and on Whit Monday. Communications should be addressed to the Hon. Sec., Mr. R. H. Bentley, 31 Adolphus Road, Brownswood Park, South Hornsey.

A NEW substance, singular alike in its chemical nature and in its properties, has been discovered by M. Péchard. It is a mixed acid derived from oxalic and molybdic acids, and is therefore termed oxalomolybdic acid. It is a solid, crystallizing in large monoclinic prisms, and forms a well-defined series of salts. Berzelius long ago found that molybdenum trioxide readily dissolved in a hot solution of oxalic acid, but appears never to have investigated the nature of the reaction. When the molybdic acid has been added almost to saturation the liquid becomes syrupy, and on evaporation yields crystals of the new oxalomolybdic acid, which on analysis give numbers corresponding to the formula $C_2H_2O_4 . MoO_3 . H_2O$. The finest crystals are obtained by dissolving the viscous mass, formed on evaporating the saturated solution of the acid, in dilute nitric acid, and allowing it to evaporate in a desiccator. Oxalomolybdic acid is almost totally insoluble in strong nitric acid, and if an excess of nitric acid be added to a saturated solution of the new acid, small crystals at once separate; but if dilute nitric acid be employed, the crystals form more slowly, and are consequently much larger and more perfect. The crystals dissolve in cold water, more rapidly on warming, yielding a colourless and strongly acid liquid. That it is a true mixed acid is shown by the fact that it forms crystalline salts with metals. If a solution of silver nitrate is added to a warm solution of the acid in water, a yellow crystalline precipitate of the silver salt, $C_2Ag_2O_4 . MoO_3$, is thrown down. This salt is insoluble in water, but, like many other silver salts, is readily dissolved by ammonia. Barium chloride or baryta water precipitate in a similar manner the barium salt $C_2BaO_4 . MoO_3$, in the form of small colourless crystals. The sodium salt, $C_2Na_2O_4 . MoO_3 . 5H_2O$, is readily obtained in good crystals by neutralizing the acid with soda. The crystals of oxalomolybdic acid, when dry, may be preserved unchanged either in sunshine or in the dark. But, if moist, they quickly become coloured blue when exposed to the sun's rays. If characters be written on paper with the solution, they remain invisible in a weak light; but, when exposed to sunshine, they rapidly become visible, turning to a deep indigo colour. It is curious that this effect only happens when the solution is spread over paper or other surfaces, for the solution itself may be kept unaltered in the bottle for any length of time, except for a trace of blue at the edge of the meniscus, where, by surface action, a little is spread against the interior glass walls. If a sheet of paper be immersed in a saturated solution of the acid, dried in the dark, and then exposed behind an ordinary photographic negative, a very sharp print in blue may be obtained by exposure to sunlight for about ten minutes. The colour instantly disappears in contact with water, so that if a piece of this sensitized paper be wholly exposed to sunlight, one may write in white upon the blue ground by using a pen dipped in water. If, however, the paper with its blue markings be exposed to a gentle heat for a few minutes, the blue changes to black, and the characters are then no longer destroyed by water.

THE Pilot Chart of the North Atlantic Ocean for the month of May shows that the month of April commenced with generally high barometer and moderate weather over the greater part of the trans-Atlantic routes, followed by easterly gales on the 3rd, and continuing in the eastern regions until the 11th. On the 7th and 15th, areas of high barometer left the American coast, and slowly traversed the ocean, reaching Europe on the 15th and 26th respectively. Several storms visited the American coast, one off Hatteras on the 7th and 8th being of marked severity, causing the water to rise a foot higher than ever known before at Norfolk, and doing great damage both on shore and at sea. There was a great increase of fog, especially off the coast of the United States. A large iceberg was seen on the 9th, in lat. 48° N., and long. 44° 40′ W.

A LIMITED number of copies of the first part of the "Bibliography of Meteorology," which has been for many years in course of preparation by the Washington Signal Office, has been issued in a lithographic form by General Greely. It contains 382 quarto pages, and includes all the titles of books and articles bearing upon the subject of temperature from the origin of printing to the close of 1881. Similar titles covering the period from 1882 to 1887 have also been prepared, but are not included in the present volume. The classification of the titles is based upon a scheme furnished by Dr. A. Lancaster, of Brussels, and is arranged under nineteen subdivisions, the arrangement of each subdivision being chronological under the authors' names, and, at the end, a list of authors' names is given, with references to the pages on which their works are found. We think that, considering the large amount of materials to be dealt with, this is the best arrangement that could be made, although, whenever a minor classification is attempted, it invariably leads to difficulties of arrangement, and to corresponding difficulties in turning up any particular work. We should like to have seen some reference to the libraries in which the older works are to be found, as has been done for all titles given in the Brussels catalogue. The work is one of the greatest importance to all meteorologists, and we can only hope that the favourable reception it is sure to meet with in all countries will induce Congress to order its regular publication, and that of the volumes relating to all other meteorological subjects, the materials for which are already prepared. It was on this distinct understanding that Mr. G. J. Symons handed over his 20,000 titles to General Hazen, some years ago.

AT a recent meeting of the New York Academy of Sciences, General Andrews, commenting on a paper about the proposed Tehuantepec ship railway, made some interesting remarks on the general subject of ship railways. Estimates which he regards as incontrovertible show that a ship can be hauled by a locomotive over a ship-railway, or, as he prefers to designate it, a ship-tramway, with the expenditure of only one-half the amount of coal which the same ship must burn to propel herself through the water of a canal. The most frequent objection urged against the practicability of the scheme is that it would rack the ship; but General Andrews explained that the weight is so distributed among the numerous supports that no one need sustain a greater weight than a man presses upon his foot in walking. The gradients of the route will be very slight, not exceeding 2 inches in 400 feet, the entire length of a vessel. He had made observations, during a voyage aboard the steamer *Britannic*, to measure the amount of strain to which she was exposed in a sea of no very great roughness, and found by stretching cords that the steamer was bent sixteen inches by the waves, but without the slightest injury: hence he infers that the stress on a vessel in crossing the isthmus would be inappreciable and harmless.

MR. ALEXANDER DURLACHER has presented to the Royal Colonial Institute an interesting collection of native weapons and implements from Western Australia.

A RESOLUTION has been issued by the Government of India, dealing with the preservation of antiquarian treasures, with the view of making known the conditions under which the Government can claim articles of archæological interest, and to provide for their better preservation for the public by holding out the prospect of sufficient reward to finders of treasures. The resolution lays especial stress on the importance of paying proper consideration to the claims and expectations of these latter, as the end in view will be defeated if those who discover objects of antiquarian value are not induced by the hope of sufficient reward to make their discoveries known to the public authorities.

CAPTAIN A. P. MADSEN lately communicated to the Northern Antiquarian Society of Copenhagen an account of his examination of the celebrated great "kitchen-midden" at Meilgaard, in Jutland, which has only once before (in 1869) been slightly examined. It is now situated several miles inland, but the configuration of the country showed that at the time of its formation a bay existed there. The midden was at one time some 12 feet in depth, but is now only 6. Oyster-shells predominated, then came the common blue mussel and winkles. There were also shells of three kinds of other mussels, of which two are extinct, but the third species is still found in the Limfjord. There were three places with remnants of charcoal and ashes. The bones found were those of water rats, ring seals, grey seals, dogs, pigs, foxes, martens, otters, boars, roe-deer, stags, bullocks; common swans, wild ducks, the great loon, sea-gulls, ring-doves, and crows; and of fishes, those of salmon, jack, eel, cod, and flounder. Of implements from the Stone Age were flint chisels, hooks of bone, a flint wedge, arrow-heads, drills, &c. The quantity of the remains indicated that a considerable population had lived in the vicinity, who no doubt brought the spoils of the chase thither. The land was now 20 feet above sea-level, but there was every appearance of the site having once been on a promontory by the sea. Many of the middens in Jutland were now situated from five to six miles inland, but had undoubtedly once lain by the sea. In one midden, Captain Madsen had found split marrow-bones, ornamented pottery, and polished implements, together with bones of sheep and goats, but no marine shells, indicating that there were also middens from a more recent period. Commenting upon these explorations, Prof. Japetus Steenstrup maintained that Captain Madsen's account of the rising of the land was exaggerated.

THE last number of the *Rendiconti della R. Accademia dei Lincei* contains a reference to an Italian precursor of Franklin, the Venetian physician Eusebio Sguario, reputed author of a work on "Electricity, or the Electrical Forces of Bodies," published in 1746. In this work occurs the following passage:—"Still it seems impossible for the violence of a subtle effluvium to acquire such intensity, however increased we may suppose it to be, unless by this means we should succeed in discovering the tremendous velocity of that subtle igneous matter which constitutes lightning. And who will ever venture boldly to deny that lightning is nothing else than a subtle electrical substance impelled to the last degree of its violence? It would certainly be a fatal surprise for that experimenter, who, finding in this way a means of producing artificial lightning, might fall a victim to his curiosity." This was written two years before the appearance of the work on physics by Nollet (Paris, 1748), who has hitherto been supposed to be the first writer who has expressed in clear language the close relation existing between the phenomena of electricity and lightning.

THE British Secretary of Legation in Rio de Janeiro, in a recent report states that for many years, though with varied intensity, a destructive disease has existed in the best zone of territory for coffee in the province of Rio de Janeiro. It has never been so bad as the coffee-leaf disease in Ceylon and Java, but still has done much harm. A scientific Government *employé*, Dr. E. Gölde, in correspondence with Dr. Soltmedel, of Java, has now almost proved that the Brazilian root-disease and the Ceylon leaf-disease have the same origin—namely, a small worm in the root, belonging to the group of Nematoids, similar to the worm in beetroots in Europe.

THE Hydrographical Department of Russia has devoted, since 1837, a good deal of attention to the secular rising of the coasts of the Baltic Sea, and a number of marks have been made on the rocky coasts of the Gulfs of Bothnia and Finland in order to obtain trustworthy data as to the rate of the upheaval of the coasts. Since 1869, observations have been carried on in a systematic way for measuring the changes in the level of the Baltic at several of the above-mentioned marks, and the results of the observations are now summed up by Colonel Mikhailoff in the *Izvestia* of the Russian Geographical Society (vol. xxiv. 3). Taking only those stations at which the secular change could be determined for a number of years varying from thirty-one to thirty-nine years (1839-78), the rise of the coast in a century would appear to be as follows: Aspö, 20·3 inches; Lehtö, 11·5 inches; Island of Kotkö, 26·7; Sveaborg, 22·8 and 25·1; Hangöudd, 33·7; Island of Skotland, 12·5; Island of Jussari, 31·6; Tverminö, 36·2; Island of Gloskär at Redhamn, 12·2. It thus appears that the figure of about three feet in a century, which was deduced from former observations, cannot be very far from the truth. As to local anomalies, they remain still unexplained.

THE additions to the Zoological Society's Gardens during the past week include two Yellow-fronted Tanagers (*Euphonia flavifrons*) from Dominica, presented by Mrs. Herbert; two Manx Shearwaters (*Puffinus anglorum*) from the Scilly Islands, presented by Mr. F. Hensman; an Ocelot (*Felis pardalis*) from South America, deposited; four Black-tailed Godwits (*Limosa ægocephala*), European, purchased; two Indian Muntjacs (*Cervulus muntjac* ♂ ♀) from India, received in exchange; a Persian Gazelle (*Gazella subgutterosa* ♀), two Bennett's Wallabys (*Halmaturus bennetti* ♀ ♀), a Hog Deer (*Cervus porcinus* ♂), a Collared Fruit Bat (*Cynonycteris collaris*), two Grey Wagtails (*Motacilla melanope*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

COMET 1888 *e* (BARNARD, SEPTEMBER 2).—The following ephemeris for Berlin midnight for this object is in continuation of that given in NATURE, vol. xxxix. p. 616:—

1889.	R.A. h. m. s.	Decl. ° ′	Log *r*.	Log Δ.	Brightness.
June 1	22 54 22	2 39·9 N.	0·3730	0·3441	2·1
5	22 47 38	2 40·5	0·3786	0·3317	2·1
9	22 40 4	2 38·1	0·3842	0·3193	2·2
13	22 31 38	2 32·5	0·3898	0·3070	2·3
17	22 22 16	2 23·6	0·3954	0·2952	2·4
21	22 11 57	2 10·7 N.	0·4010	0·2839	2·4

The brightness at discovery is taken as unity.

THE MOTION OF STARS IN THE LINE OF SIGHT.—Prof. H. C. Vogel, noting the difficulty which has been experienced at the Greenwich and Rugby Observatories in making eye-observations of the displacement of the lines in stellar spectra due to the approach or recession of the stars, has endeavoured to solve the problem by means of photography, and has met with very considerable success. The atmospheric tremors, which are so baffling and often misleading to direct eye-observation, counteract each other and produce little or no effect on the photograph; and the feebleness of the light of a star when spread out into a long spectrum is overcome by a lengthened exposure. Prof. Vogel gives the following results (in German miles per second) for five stars, of which four have been observed at Greenwich:—

Star.	Vogel.	Greenwich.
Capella	+3·5	+4·8
Aldebaran	+6·5	+6·8
Polaris	−3·5	not observed
α Persei	−1·5	−4·8
Procyon	−1·5	+0·8

The Greenwich observations for 1888, nearly contemporaneous therefore with the Potsdam observations, give the motion of Procyon as −0·8. The agreement of the individual photographs is very gratifying, and is much closer than that of the eye-measures made on different nights.

THE LATITUDE OF DETROIT.—A determination of the latitude of the Detroit Observatory has recently been made by Dr. Ludovic Estes.[1] The zenith telescope was employed, and the results were discussed by the method of least squares. The value arrived at after all corrections is 42° 16′ 48″·66 ± 0″·051. An interesting point in connection with the observations is that smaller values were obtained from low stars, which seems "to indicate that northern stars are refracted less than southern, for the same zenith distance; and that, therefore, the layers of the atmosphere, instead of being parallel to the surface of the earth, are depressed more rapidly toward the north" (p. 54).

THE MINOR PLANET VICTORIA.—A programme has been prepared by Dr. Gill, of the Royal Observatory, Cape of Good Hope, for observations of the minor planet Victoria at its opposition in 1889; the opposition in right ascension occurring on July 16, and the primary object of these observations being to determine the parallax of the sun from heliometric measures. A list of comparison stars is given, and is so arranged that when the planet is situated at the greatest zenith distance where good observations may be made, one comparison star may be below and another above it, the measurement by the heliometer of the difference of two nearly equal and opposite distances giving the most accurate result obtainable.

Victoria has a zenith distance of 62° at an hour-angle of 4h. for the Cape, 2h. for European Observatories, and 3h. for Newhaven. A list is given of the limits of hour-angle during which observations of the planet may be made from June 10 to August 29.

The corrected ephemeris of the planet has been computed, and it is hoped that co-operating meridian Observatories will determine the places of the thirty-seven comparison stars with the meridian circle, and at the same time procure as many meridian observations of the planet as possible. Provided that means exist for determining the distortion of the photographic film, and the optical distortion of the field, photographs taken in both hemispheres showing the planet lengthened out so as to form a straight line, whilst neighbouring stars are well defined, are available for the determination of parallax. Dates are also given when photographic observations of Victoria may be advantageously combined with heliometer observations.

MERIDIAN OBSERVATIONS OF IRIS.—A similar programme to the above was issued by Dr. Gill, in September 1888, for observations of the minor planet Iris; and Mr. Arthur A. Rambaut, assistant astronomer at Dunsink Observatory, has made observations, with the meridian circle, of the places of the planet and the twenty-eight comparison stars given. The measures will be found in *Monthly Notices R.A.S.*, March 1889, and extend from September 7, 1888, to January 10, 1889. Between these dates twenty-six observations of Iris were made, and its apparent right ascension and declination found. During the progress of the work two comparison stars were added to Dr. Gill's list.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1889 *JUNE* 2–8.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on June 2

Sun rises, 3h. 50m.; souths, 11h. 57m. 45·8s.; daily increase of southing, 9·6s.; sets, 20h. 6m.: right asc. on meridian, 4h. 42·3m.; decl. 22° 15′ N. Sidereal Time at Sunset, 12h. 52m.

Moon (at First Quarter on June 6, 20h.) rises, 6h. 42m.; souths, 15h. 2m.; sets, 23h. 17m.: right asc. on meridian, 7h. 46·8m.; decl. 22° 19′ N.

Planet.	Rises. h. m.	Souths. h. m.	Sets. h. m	Right asc. on meridian. h. m.	Declination on meridian. ° ′
Mercury	5 4	13 25	21 46	6 9·7	23 56 N.
Venus	2 25	9 28	16 31	2 12·5	11 33 N.
Mars	4 1	12 16	20 31	5 0·6	23 19 N.
Jupiter	21 49*	1 44	5 39	18 26·6	23 6 S.
Saturn	8 52	16 28	0 4*	9 13·2	17 17 N.
Uranus	14 52	20 22	1 52*	13 7·7	6 31 S.
Neptune	3 31	11 18	19 5	4 2·6	19 5 N.

* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

June.	h.	
4	8	Saturn in conjunction with and 1° 47′ south of the Moon.
6	—	Venus at period of greatest morning brilliancy.
6	20	Mercury stationary.

Saturn, June 2.—Outer major axis of outer ring = 39″·1: outer minor axis of outer ring = 10″·6: southern surface visible.

Meteor-Showers.

	R.A. °	Decl. °	
Near β Coronæ	228	30 N.	June 2.
,, β Ophiuchi	262	5 N.	Rather slow.
,, α Cephei	317	61 N.	Swift; streaks.

---

[1] Ann Arbor, Mich.: The Register Printing and Publishing Company, 1888.